F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

Flight No.:	B102	
Date:	14 Jun 2005	
Take Off	07:52:46	13:37:03
Landing:	12:04:45	16:34:50
Flight Time	4h11m59	2h57m47

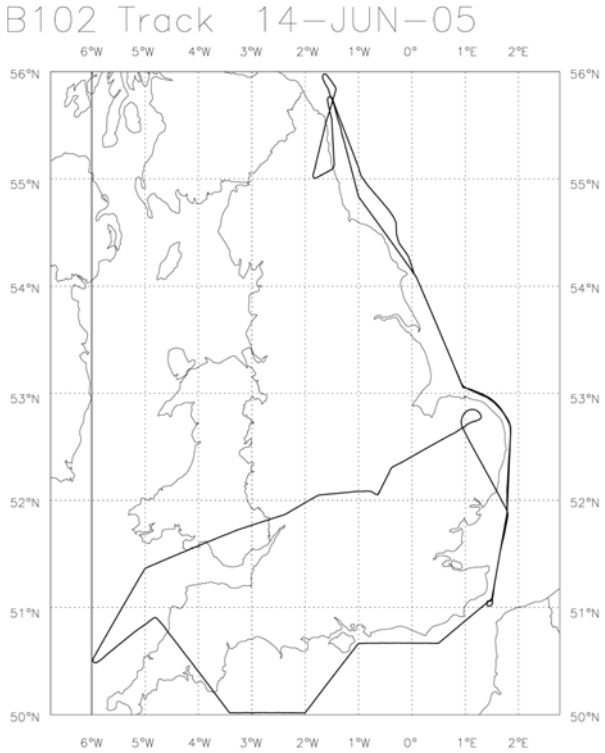
Campaign: AMPEP

Trials Instructions:

Operating Area: Circumnavigate via Cranfield, south Wales, uk south and east coast to Newcastle.

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Alan Foster	Directflight
3	CCM	Gaynor Ottaway	Directflight
4	Mission Scientist 1	Eiko Nemitz	CEH
5	Flight Manager	Alan Woolley	FAAM
6	Cloud Physics / CCM2	Jamie Trembath	FAAM
7	Mission sci trng / bags 2	Ute Skiba	CEH
8	Core Chemistry / TDLAS	Ruth Purvis	FAAM
9	CVI	Paul James	FAAM
10	Filters	Maureen Smith	FAAM
11	CVI Training	Stuart Heath	FAAM
12	PTRMS	Anne Hulse	UEA
13	CCM Training	Jackie Mulholland	Directflight
14	WAS / PAN	Maria Nielsdottir	UEA
15	Bag Sampling 1	Debbie Polson	CEH
16	AMS	Johnny Crosier	Manchester University
17	NOxy	Dave Stewart	UEA
18			
19			
20			

Flight Track:

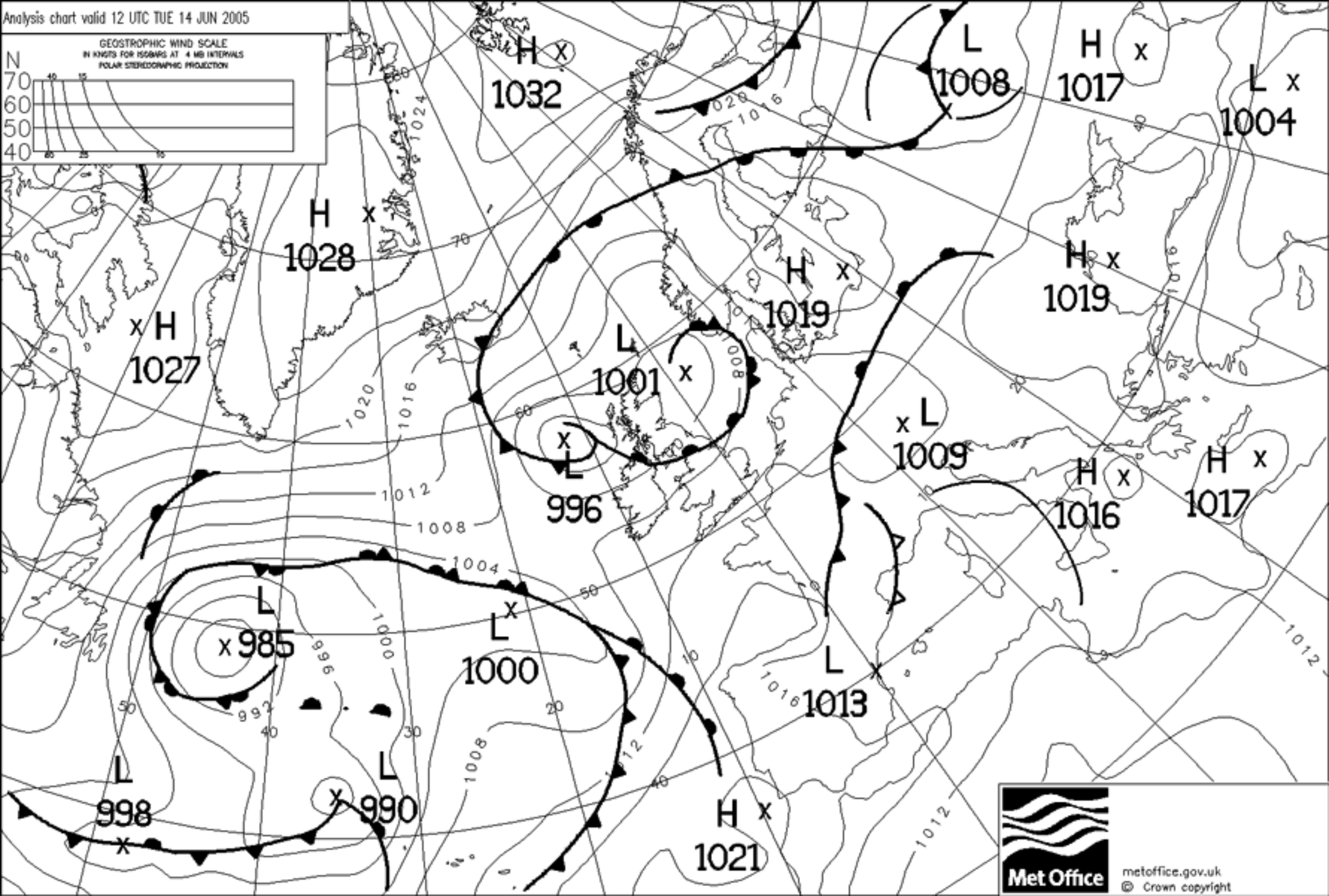


FLIGHT SUMMARY

Flight No b102
Date: 14/06/05
Project: Ampep
Location: wales, south coast, east coast to newcastle. Anticlockwise.

Start Time	End Time	Event	Height (s)	Hdg	Comments
074200		engine start	0.49 kft	128	
074219		inu to nav	0.49 kft	128	
074558		taxy start	0.49 kft	128	
075246		T/O	0.48 kft	212	from cranfield
080658		asp open	10.0 kft	246	
082921	083809	Profile 1	10.0 - 1.3 kft	252	
083816	085225	Run 1	1.2 - 1.3 kft	219	
085411	090201	Run 2	1.1 kft	064	
090224	090416	Profile 2	1.1 - 0.13 kft	058	
090417	092534	Profile 3	0.13 - 0.20 kft	059	
090429		Profile 3	0.20 kft	059	interrupt 100ft
090558		Profile 3	0.23	059	resumed
090637		Profile 3	0.61 kft	060	interrupt 500ft
090813		Profile 3	0.56 kft	134	resume
090953		Profile 3	2.1 kft	143	interrupt 2000
091053		Profile 3	2.1 kft	137	resume
091300		Profile 3	4.0 kft	140	interrupt 4000
091404		Profile 3	4.0 kft	140	resumed
091605		Profile 3	6.0 kft	139	interrupt 6000
092623	092951	Run 3	6.0 kft	089	
092951	093459	Profile 4	6.0 - 1.1 kft	091	
093459	093911	Run 4	1.1 kft	092	
093944	095315	Run 5	1.1 kft	038	
095350	100809	Run 6	1.1 kft	094	
100830	101955	Run 7	1.1 kft	052	
102022	103312	Run 8	1.1 kft	005	
103333	104604	Run 9	1.1 kft	354	
104604	105718	Run 10	1.2 kft	287	
105808	111729	Run 11	1.2 kft	305	
111729	114840	Run 12	1.2 - 1.3 kft	325	
115926		asp closed	4.4 kft	180	
120445		Land	0.48 kft	246	at newcastle
120919		standstill	0.51 kft	206	55'02.00N, 1'41.93W
132623		engine start	0.50 kft	206	
133102		taxy start	0.50 kft	206	
133703		T/O	0.48 kft	245	from newcastle
133958		air sample pipes	5.8 kft	017	
135054	135151	Run 13	5.4 kft	017	
135202	140124	Profile 5	5.4 - 0.4 kft	322	
135254		Profile 5	4.4 kft	318	interrupt 4000
135534		Profile 5	4.4 kft	316	resume
135738		Profile 5	2.3 - 0.30 kft	166	interrupt 2000
135839		Profile 5	2.3 kft	153	resume
140137	140231	Run 14	0.37 - 0.38 kft	165	100 ft run
140231	140321	Profile 6	0.44 - 0.76 kft	161	
140321	140429	Run 15	0.76 - 0.92 kft	159	500 ft run
140429	140521	Profile 7	0.92 - 1.3 kft	170	
140521	141501	Run 16	1.3 - 1.2 kft	161	
141526	143115	Run 17	1.2 kft	150	
143115	145050	Run 18	1.2 - 1.1 kft	151	
145129	150216	Run 19	1.1 kft	158	
150216	151711	Run 20	1.1 kft	177	
151711	153231	Run 21	1.1 kft	185	
153612	154244	Run 22	1.0 - 1.1 kft	005	
154311	154526	Profile 8	1.1 - 0.11 kft	009	
154526	155732	Profile 9	0.11 - 6.0 kft	017	
154550		Profile 9	0.20 kft	013	interrupt
154640		Profile 9	0.16 kft	014	resume
154729		Profile 9	0.54 kft	012	interrupt
154816		Profile 9	0.56 kft	007	resume

155000	Profile 9	2.1	kft	319 interrupt 2000
155059	Profile 9	2.1	kft	322 resume
155307	Profile 9	4.0	kft	321 interrupt 4000
155415	Profile 9	4.0	kft	323 resume
155624	Profile 9	6.0	kft	321 interrupt 6000
162446	asp closed	4.5	kft	244
163450	Land	0.43	kft	217 at cranfield
163818	standstill	0.42	kft	307 52'04.36N, 0'37.50W


Analysis chart valid 12 UTC TUE 14 JUN 2005
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
H 1032
L 1008
H 1017
L 1004
H 1028
H 1027
H 1019
H 1019
L 1001
L 996
L 1009
H 1016
H 1017
L 985
L 1000
L 1013
L 998
L 990
H 1021
1024
1020
1016
1012
1008
1004
1000
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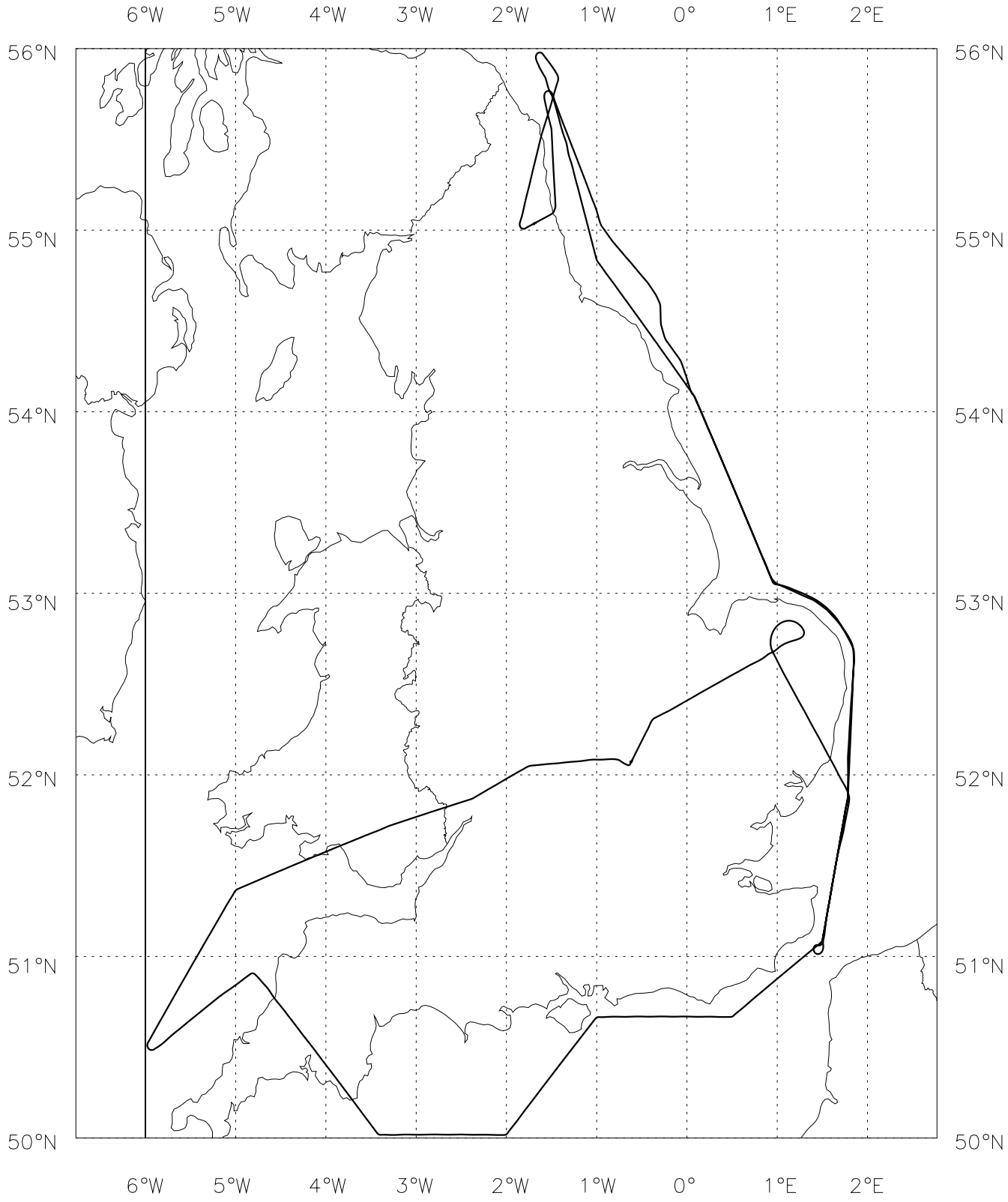
B102 Track 14-JUN-05



Sortie Brief: AMPEP

Flight Number : B102

Mission Scientist: Eiko Nemitz, CEH

Date 14-June-2005

Outline schedule:

05:00 – Power to aircraft – warm-up
07:00 – Briefing
08:05 – Clear aircraft and security check
08:20 – Doors close
08:50 – Take off Cranfield
12:50 – Land Newcastle for refueling; Ute Skiba takes over as Mission Scientist
14:15 – Take off Newcastle
16:55 – Land Cranfield
17:25 – Debrief
18:55 – Power down

Location: Anticlockwise circumnavigation of England, Wales

Sortie Aims: To measure the UK pollutant budget of a range of gases and aerosols through a round-Britain flight and to derive the chemical processing (gas/aerosol partitioning & oxidation state) of the air mass in Westerly airflow over the UK. The frontal activity to the North and West limits the area of the UK over which we can work to Southern Britain, but this includes the major pollutant source areas.

Sortie Summary: The budget measurements will be based on a circumnavigation of England, Wales, hugging the coastline along a pre-defined flight path. Vertical profiles (50 – 6000 ft) once upwind and twice downwind of the source region. These should clearly extend into the free troposphere (Mission Scientist to verify from profiles of humidity, temperature and CO). Vertical profiles inside the main plumes will need to be avoided and the location of the profiles is therefore to be confirmed during the flight. These measurements will establish the upwind concentration, the concentration differential at the top of the boundary layer and the concentration in the outflow from the source region. Flight ceiling will be 10000ft. Cabin pressure will be maintained at 1200ft, to minimize expansion of the Tedlar bags.

Sortie Detail with approx timing

a) Take off Cranfield 10:00 and climb to 10000 ft for transit to upwind leg of the operating area. Destination waypoint 49 in the SW approaches, West of the Bristol channel; background filter run & NOxy calibration.
b) T+60 descend to 1000 ft when reaching the coast East of point 49.
   Start of filter run No 2. Start of Bag sampling (1 bag every 2 mins).
c) T+75 upwind profile while crossing Cornwall starting between WP 47 and 48 (dip to 50ft, ascent at 1000 ft min^{-1}, level out at 100, 500, 2000, 4000, 6000 for 1 min each, approx. 15 min profile duration)
d) T+90 descend to 1000ft on reaching the Channel Coast. Start of filter set No 3.

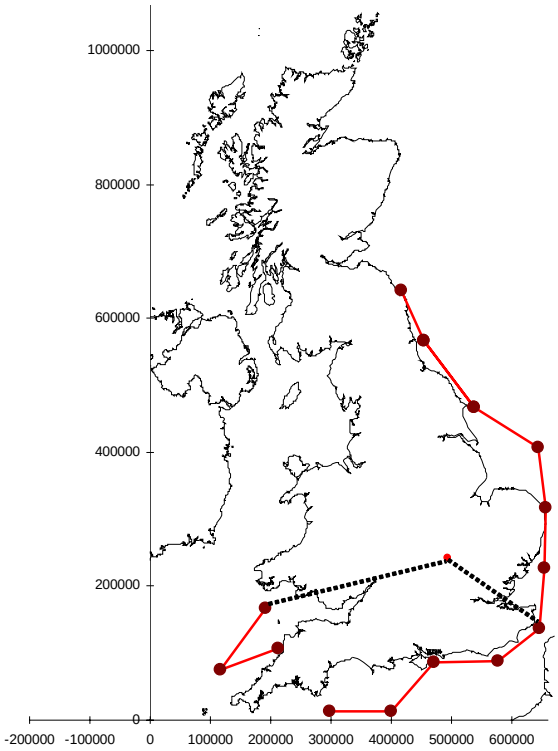
e) T+145 at point 42: start filter set No 4; increase bag sampling to 1 bag / minute.
f) T+240 land Newcastle
g) T+325 T/O Newcastle
h) T+335 downwind profile heading north (dip to 50ft, ascent at 1000 ft min^{-1}, level out at 100, 500, 2000, 4000, 6000 for 1 min each, approx. 15 min profile duration)
i) T+350 U-turn at WP77; start of filter set 4.
j) T+450 on leaving coast near WP42; downwind profile heading north (dip to 50ft, ascent at 1000 ft min^{-1}, level out at 100, 500, 2000, 4000, 6000 for 1 min each, approx. 15 min profile duration); followed by NOxy calibration
k) T+ 485 Land Cranfield

Crew List:

1. Pilot 1 - Alan Roberts
2. Pilot 2 – Alan Foster
3. CCM - Gaynor Ottaway
4. CCM Training – Jackie Mulholland
5. Cloud Physics / CCM2 – Paul James
6. Flight Manager – Alan Woolley
7. Mission Scientist – Eiko Nemitz
8. Core Chemistry/TDLAS – Ruth Purvis
9. Filters – Maureen Smith
10. CVI – Paul James
11. CVI Training – Stuart Heath
12. WAS/PAN – Maria Nielsdottir
13. Bag Sampling 1 – Debbie Polson
14. Bag Sampling 2 / Mission Scientist Training – Ute Skiba
15. AMS – Johnny Crosier
16. PTRMS – Anne Hulse
17. NOxy – Dave Stewart

MAPS:

Flight plan for 14th June 2005 AMPEP starting in the SW approaches and tracking anticlockwise



10 pm T/O Cranfield
transit over land, descend to 1000 ft on reachi

49	191195.7	167394.5
47	116386.8	74400.05
37	?	?
48	212243.2	107206.6

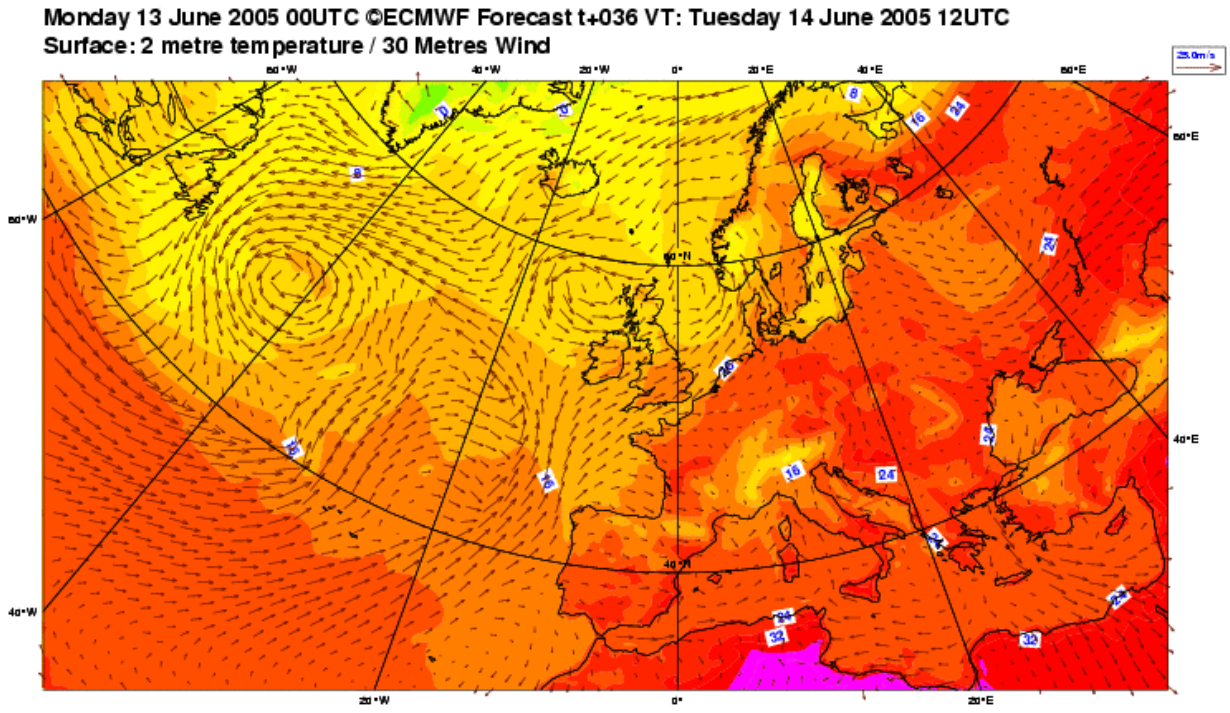
profile while flying over land

46	298518.2	13979.75
45	400000	13018.35
44	470663.7	85763.38
43	576650	88268.13
42	645097.8	137444.2
41	654600.3	227050.6
40	655680.8	316271.6
87	643147.3	406652.5
80	536266.2	467295.4
79	453301.3	567595.1

Refuel at Newcastle
profile while flying north

77	415724.3	641489.4
79	453301.3	567595.1
80	536266.2	467295.4
87	643147.3	406652.5
40	655680.8	316271.6
41	654600.3	227050.6
42	645097.8	137444.2

profile on leaving coast, if possible
Cranfield



Instrumentation strategies & issues:

Filter sampling: Filters will be taken throughout the flight. Filter pack 1 will contain a Teflon filter for trace metal analysis. Filter pack 2 will contain a Teflon prefilter (for major ion analysis), a nylon filter (for HNO_3 & HCl) and an acidified paper filter (for NH_3). Filters will be changed approximately every 30 minutes or when flight conditions change (as advised by the Mission Scientist). Filters are preloaded into cartridges, which need to be handled with gloves and stored in sealed bags immediately. Filter sampling will be suspended during vertical profiles and resumed when FL10 is re-attained. During breaks, filter packs will be isolated by switching off the pump (to minimise evaporation of volatile aerosol components). During initial transfer to the operating area, a set of filters should be loaded into the filter packs, without sampling, to provide a blank value.

AMS: The AMS will be operated continuously during the flight. Monitored masses will include m/z 16, 18, 28, 30, 43, 44, 46, 57 and 64. The inlet remains closed until airborne to minimize contamination during taxi take-off.

Core Chemistry: CO, SO_2, NO and NO_2 will be measured continuously during the flight. CO will be calibrated every 30 minutes at FL10.

Tedlar bags: Tedlar bags will be filled at a flow rate of 6 lpm, filling a bag over a duration of 30 s. Bags will be filled every 3 minutes upwind and every minute downwind of the source region and during each leveling out for a profile step. Bags should be filled to about 90% of their capacity to maximise sample volume. The cabin pressure will be tightly controlled. Bags from first part of flight can be stored in cargo hold for second part.

Aerosol & cloud physics: CN and PCASP are operated continuously.

Core meteorology & state: Are recorded as standard. Video recording of front facing and downfacing cameras.

PTRMS: Operation as normal.

NOxy: Operation as normal; calibration during transits at FL100

WAS: Sampling density and location to be decided.

TDL for CH_4 and CO_2: Operated by FAAM.

Quick-look data: pressure height, lat, long, temp, RH, CN, SO_2, NO, NO_2, O_3, CO

FLIGHT NUMBER: B102	DATE:	OPERATOR: RMP	
PROJECT: AMPEP			

CORE CHEMISTRY PRE FLIGHT LOG

PRE POWER UP	
All sample lines are connected to the rack	OK
All cylinders pressures are OK	OK
Ozone Span = 504, Offset = 50	OK

GAS PRESSURES	N_2 (bar)	CO_2 / Argon (bar)	CO standard (bar)
PRE FLIGHT			
POST FLIGHT			

POST POWER UP - GROUND				
Ozone Sample Flow 1 (LPM)	**Ozone Sample Flow 2 (LPM)**	**NO_x Sample Flow (LPM)**	**NO_x Ozonator Flow (LPM)**	**SO_2 Sample Flow (LPM)**
CO Time check against HORACE	**CO Lamp Flow (ml/min)**	**Pressure Monochromator (bar)**	**Pressure Cell (Torr)**	

ZEROS							Average
Ozone (ppbV)	-1	0	-1	-1	-2	-1	
NO (ppbV)	11.7	10.6	11.2	12.3			
NO_2 (ppbV)	16.1	17.4	17.1	14.8			
NO_X (ppbV)	27.8	28	28.2	27.1			
SO_2 (ppbV)	2.88	2.78	2.68	2.96	2.48		

PRE FLIGHT COMMENTS

Purafil requires changing in zero trap

FLIGHT NUMBER: B102	DATE:	OPERATOR:	RMP	
PROJECT:	AMPEP			

CORE CHEMISTRY CALIBRATION AND FLOW LOG

PREVIOUS CO CAL	Date and Flight Level	Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)
	unknown			

Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
	100	77.66	89.76	6970.86	50	
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.85	0.6	0.7	1.079	0.067	0.355
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
084204	1000ft	78.74	88.85	6996.59	50	7.12
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.95			1.112	0.069	0.465
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
093901	1000ft	80.26	87.11	6991.22	50	7.13
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		3398	0.4	0.4	1.118	0.067	0.467
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
101219	1000ft	80.52	86.88	6995.54	50	7.15
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.93	0.4	0.4	1.118	0.067	0.467
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
104731	1000ft	80.36	86.45	6947.23	50	7.14
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.95	0.4	0.4	OK	OK	Ok
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
BAD CAL						
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
14:08:13	1000ft	74.92	89.42	6698.71	50	7.13
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.82	035	0.4	OK	OK	OK

FLIGHT NUMBER: B102	DATE:	OPERATOR: RMP	
PROJECT: AMPEP			

Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
144040	1000ft	76.26	88.75	6767.97	50	7.12
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.89	0.4	0.4	1.107	0.067	0.464
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
15:15:22	1000ft	77.35	87.42	6761.94	50	7.14
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		33.85	0.4	0.4			
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample

FLIGHT NUMBER: B102	DATE:	OPERATOR: RMP	
PROJECT: AMPEP			

CORE CHEMISTRY FLIGHT LOG

GENERAL COMMENTS

CLOUD PHYSICS LOG

Flight No. B102 **Date: 14/06/05** **Operator: JT** **Page 1 of**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
08:29:31			Not asked For	Not asked For	NAF	NAF	NAF	NAF	NAF	NAF	Start Profile Decent FL100
											FL90
08:31:	130	0.07									FL80
08:32:30	97	0.08									FL70
08:33:25	60	0.08									FL60
08:34:23	363	0.49									FL50
08:35:16	274	0.09									FL40
08:36:22	365	0.1									FL30
08:37:16	314	0.1									FL20
08:38:10	280	0.09									1000ft end of profile
08:38:10	280	0.09									Start of run 1 @ 1000ft
08:40:00	288	0.09									
08:42:00	284	0.09									N.B. Heater left off as all low level
08:44:00	238	0.09									
08:46:00	211	0.09									
08:48:00	195	0.09									
08:50:00	257	0.1									
08:52:00	225	0.1									
08:53:26	213	0.09									End of run1 @
08:54:08	223	0.11									Start run 2 @ 1000ft point 47
08:56:00	218	0.09									
08:58:00	244	0.09									
09:00:00	257	0.09									
09:02:00	228	0.1									End of run 2
09:02:24	230	0.09									Profile 2 1000ft
09:03:26	238	0.09									500ft
09:04:16	304	0.09									50ft
09:04:28	359	0.09									Start Run at 100ft
09:06:00	265	0.09									start profile 3 @ 100ft
09:06:30	123	0.09									500ft interrupt P3
09:07:15	235	0.09									Start run 500ft
09:08:13	369	0.09									Restart P3 @ 500ft

CLOUD PHYSICS LOG

Flight No. B102 **Date: 14/06/05** **Operator: JT** **Page 2 of**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
09:09:00	166	0.09									1000ft
09:09:53	158	0.09									Interrupt P3 start run @ 2000ft
09:10:53	227	0.08									Restart P3 @ 2000ft
09:11:58	207	0.1									3000ft
09:13:01	140	0.1									Interrupt P3 start run @ 4000ft
09:14:02	195	0.09									Restart P3 @ 4000ft
09:15:07	133	0.09									5000ft
09:16:03	367	0.46	In cloud								Interrupt P3 start run @ 6000ft
09:25:35	56	0.07									End run FL60
09:26:23	56	0.07									Start Run 3 @ 6000ft
09:28:00	35	0.07									
09:29:51	31	0.09									End of Run 3 start of P4 descent
09:30:52	243	0.1									5000ft
09:31:52	271	0.1									4000ft
09:32:52	263	0.1									3000ft
09:33:49	424	0.09									2000ft
09:34:59	408	0.09									1000ft end of P4 start of Run 4
09:36:00	364	0.08									
09:38:00	323	0.08									
09:39:12	287	0.08									End of Run 4 @ 1000ft
09:39:45	1620	0.07									Start run 5 @ 1000ft
09:41:00	222	0.07									
09:43:00	280	0.08									
09:45:00	292	0.08									
09:47:00	307	0.08									
09:49	298	0.08									
09:51	314	0.07									
09:53:15	337	0.08									End of run 5 @ 1000ft
09:53:50	362	0.08									Start of Run 6 @ 1000ft
09:55:00	354	0.08									
09:57	321	0.08									
09:59	363	0.08									

CLOUD PHYSICS LOG

Flight No. B102 **Date:14/06/05** **Operator: JT** **Page 1 of 5**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
10:01	354	0.08									
10:03	256	0.08									
10:05	274	0.08									
10:07	264	0.08									
10:08:05	292	0.08									End of run 6
10:08:30	284	0.08									Start run 7 @ 1000ft
10:10:00	242	0.08									
10:12:00	291	0.08									
10:14	257	0.08									
10:16	431	0.08									
10:18	445	0.08									
10:19:56	475	0.08									End run &
10:20:22	443	0.08									Start run 8 @ 100ft
10:22:00	482	0.08									
10:24	453	0.08									
10:26	361	0.08									
10:28	389	0.08									
10:30	395	0.08									
10:32	412	0.08									
10:33:13	417	0.08									End of run 8
10:33:34	338	0.07									Start of run 9 @ 1000ft
10:35:00	473	0.08									
10:37:00	459	0.08									
10:39	454	0.08									
10:41	428	0.08									
10:43	308	0.08									
10:45	401	0.08									
10:46:04	410	0.08									End of run 9
10:46:04	Not	called	No log until	Data look	Uniform @	approx	300				Start of run 10 @ 1000ft
10:56:00	246	0.08									
10:57:18	432	0.08									End of run 10
10:58:09	287	0.08									Start of run 11 @ 1000ft

CLOUD PHYSICS LOG

Flight No. B102 **Date:14/06/05** **Operator: JT** **Page 2 of 5**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
11:00:00	409	0.08									
11:02:00	381	0.08									
11:04	415	0.08									
11:06	232	0.08									
11:08	241	0.08									
11:10	270	0.09									
11:12	257	0.09									
11:14	214	0.08									
11:16	236	0.08									
11:17:30	247	0.08									End run 11 start of run 12
11:19:00	332	0.08									
11:21	200	0.08									
11:23	103	0.13									
11:25	199	0.33									
11:27	643	0.26									
11:29	205	0.15									
11:31	184	0.14									
11:33	320	0.14									
11:35	163	0.08									
11:37	153	0.08									
11:39	128	0.07									
11:41	165	0.09									
11:43	254	0.09									
11:45	124	0.07									
11:47	112	0.08									
11:48:41	88	0.07									End of Run 12
											Break in Newcastle for refuelling

CLOUD PHYSICS LOG

Flight No. B102 **Date:14/06/05** **Operator: JT** **Page 3 of 5**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
13:50:45	133	0.19									Start Run 5000ft
13:51:45	141	0.32	In cloud								End run start P5 descent @ 5000ft
13:52:55	278	0.13									P5 interrupt 4000ft start run
13:53:56	240	0.52									End run
13:55:25	97	0.2									Restart P5 @ 4000ft
13:56:32	248	0.09									3000ft
13:57:38	222	0.09									P5 interrupt 2000ft start run 13
13:58:40	316	0.1									End run
13:59:45	290	0.09									Restart P5 1000ft (down to 50ft)
14:01:30	246	0.09									End P5 start Run 14 at 100ft
14:02:33	265	0.09									End run 14
14:03:16	123	0.09									Start run 15 @ 500ft
14:04:25	253	0.09									End run 15
14:05:15	201	0.09									Start run 16 @ 1000ft
14:07:00	268	0.2									
14:09:00	152	0.08									
14:11:00	245	0.08									
14:14:55	95	0.09									End of run 16
14:15:26	98	0.09									Start run 17 @ 1000ft
14:17:00	116	0.09									
14:19:00	164	0.09									
14:21:00	172	0.09									
14:23:00	290	0.09									
14:25:00	225	0.09									
14:27:00	310	0.09									
14:29:00	648	0.1									
14:31:00	479	0.1									
14:31:16	326	0.1									End run 17 & start run 18 @ 1000ft
14:33:00	326	0.09									
14:35:00	352	0.09									
14:37:00	394	0.09									
14:39:00	403	0.09									

CLOUD PHYSICS LOG

Flight No. B102 **Date:14/06/05** **Operator: JT** **Page 4 of 5**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
14:41:00	365	0.1									
14:43:00	393	0.1									
14:45:00	379	0.09									
14:47:00	368	0.08									
14:49:00	439	0.09									
14:50:51	644	0.09									End of run 18
14:51:30	594	0.09									Start run 19 @ 1000ft
14:53:00	595	0.09									
14:55:00	641	0.09									
14:57:00	468	0.09									
14:59:00	559	0.09									
15:01:00	496	0.01									
15:02:15	547	0.09									End run 19 & start run 20 @ 1000ft
15:04:00	414	0.09									
15:06:00	486	0.08									
15:08:00	498	0.08									
15:10:00	553	0.08									
15:12:00	602	0.08									
15:14:00	590	0.08									
15:16:00	595	0.08									
15:17:08	582	0.08									End run 20 start run 21 @ 1000ft
15:19:00	672	0.08									
15:21:00	479	0.08									
15:23:00	425	0.08									
15:25:00	429	0.08									
15:27:00	416	0.08									
15:29:00	394	0.08									
15:31:00	387	0.08									
15:32:32	255	0.07									End of run 21
15:36:12	252	0.07									Start run 22 @ 1000ft
15:38:00	355	0.09									
15:40:00	373	0.08									

CLOUD PHYSICS LOG

Flight No. B102 **Date:14/06/05** **Operator: JT** **Page 5 of 5**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
13:42:00	333	0.08									
13:42:45	372	0.08									End of run start P6
13:43:13	329	0.08									Start P8 descent @ 1000ft
13:44:11	382	0.08									500ft
13:45:				terminated	BIRDS!						50ft
15:45:42	436	0.08									Start RUN 100FT
15:46:42	560	0.08									End run recom. Profile 8 to 500ft
15:47:18	319	0.08									Start run o 500ft
15:48:17	735	0.08									End run recom. profile 8 @ 500ft
15:49:18	427	0.08									1000ft
15:50:02	372	0.08									Interrupt P8 2000ft start run
15:51:00	527	0.08									End run recom. P8 @ 2000ft
15:52:09	402	0.09									3000ft
15:53:08	417	0.09									Interrupt P8 start run @ 4000ft
15:54:10	442	0.08									End run recom. P8 @ 4000ft
15:55:23	548	0.09									5000ft
15:56:25	416	0.33	In cloud								End P8 start run @ 6000ft
15:57:32	323	0.07									End run @ 6000ft

Flight No: B102 Date: 14.6.05 Operator: MAUREEN SMITH

Run No	Disk No 1 Top	Disk No 2	Disk No 3	Top/ Bottom	Time On	Time Off	Flight Run	Accum Vol [l]	Comments
Filters 1	129	124	87	TPT 001	080830	082820	3 Transit	NIL	Blank Pump OFF
Filters 1	123	136	58	TNPB 001	080750	082850.		NIL	Blank. FL100
Filters 2	159	91	56	TPT 002	~~083850~~ ~~085050~~	090228	RUN 1	0852	Loaded at 085050
Filters 2	118	140	4	TNPB 002	083850 ~~085050~~	090228	RUN 1	341	" "
Filters 3	135	134	100	TPT 003	093507	102019	4 → 7	1655	
Filters 3	88	151	13	TNPB 003	093507	102019	4 → 7	690	finish at WP42
Filters 4	149	150	97	TPT 004	103120	114900	during 8 → 12	2296	~~Start at WP42.~~
Filters 4	130	120	23	TNPB 004	103120	114900	" 8 → 12	1137	start just before WP41
			Refuel at	Newcastle					
Filters 5	142	126	132	TPT 005	140809	144708	16 → 18	1346	Sample to WP 87
Filters 5	50	131	18	TNPB 005	140809	144708	16 → 18	554	" " " "
Filters 6	160	141	55	TPT 006	145028	154249	19 → 22	1903	
Filters 6	127	90	10	TNPB 006	145028	154249	19 → 22	767	
Filters 7	96	51	16	TPT 007	155805	161900	Noxy cal	NIL	FL100 Background
Filters 7	112	no number	21	TNPB 007	155805	161900	" "	NIL	"
				Land at	Cranfield				

Flight Manager's Instrument Status Log

Flight No. **B**102 Date: 14/06/05

Instrument	Fitted	Operated	Instrument	Fitted	Operated
Navigation			**Cloud Physics**		
INU		**Y**	**Probes**		
GPS		**Y**	FFSSP	**Y**	**N**
Satcom C		**Y**	PCASP	**Y**	**Y**
Satcom H		**Y**	2D-P	**Y**	**N**
Thermometers			2D-C	**Y**	N
De-Iced Temp		**Y**	Cloudscope	**N**	**N**
Non De-Iced		**Y**	SID 1	**Y**	**N**
Heimann	**N**		SID 2	**Y**	**N**
Hygrometers					
G. Eastern		**Y**	HVPS	**N**	
J. Williams		**Y**	CIP25	**Y**	**N**
Nevzorov		**Y**	CIP100	**Y**	**N**
TWC		**Y**			
FWVS	**Y**	**N**	**Racks:**		
Radiometers			INC	**Y**	**N**
Upper Clear	**Y**	**Y**	CCN / CNC	**Y**	**N**
" Red	**Y**	**Y**	CVI	**Y**	**Y**
" Silicon	**Y**	**Y**			
" JO1D	**Y**	**Y**	**Aerosol**		
Lower Clear	**Y**	**Y**	PSAP	**Y**	**N**
" Red	**Y**	**Y**	Nephelometer	**N**	
" Silicon	**Y**	**Y**	Filters	**Y**	**Y**
" JO1D	**N**		AMS	**Y**	**Y**
Large Radiometers					
TAFTS	**N**				
MARSS	**N**				
DEIMOS	**N**		**Others:**		
ARIES	**N**		NIR TDLAS	**Y**	**Y**
SWS	**N**		2BT O3	**Y**	**N**
Chemistry			VACC	**Y**	**N**
Ozone	**Y**	**Y**	PEROXIDE	**Y**	**N**
ECGC	**N**		Formaldehyde	**Y**	**N**
NOX	**Y**	**Y**	ADA	**Y**	**N**
CO	**Y**	**Y**	CPI	**Y**	**N**
ORAC	**Y**	**N**	NOxy	**Y**	**Y**
PAN	**Y**	**Y**	PTRMS	**Y**	**Y**
PERCA	**N**	**N**	Bag Sampling	**Y**	**Y**
WAS	**Y**	**Y**			

Faults / Incidents Log

Flight No. B102
Date: 14/06/05

Instruments

1. Video – DFC display out of focus. Inboard display switches off . Also, RFC (marked DFC…) is virtually black on pc monitor, whereas it displays well on video monitor unit.
2. NOX – occasional flutters above max chamber temp but otherwise okay.
3. TDLAS CO2 failed 30 mins before the end of the first flight. No data at all from second flight for CH4 either.
4. Horace display of data locked up at 15:50. Couldn't then retrieve data from before this time despite restarting internet explorer and then H_derive.

Aircraft

Satcom H:-